

Comparative analysis of technical efficiency for different production culture systems and species of freshwater aquaculture in Peninsular Malaysia

ABSTRACT

This study estimated the bias-corrected technical efficiency (BCTE) of different culture systems and species of freshwater aquaculture in Malaysia using bootstrapping data envelopment analysis (DEA). Data were collected from 307 respondents from three states in Peninsular Malaysia using a well-structured questionnaire as well as oral interviews. The findings indicate that all technical efficiency scores for all culture systems and species are below the optimal level (i.e. one). In addition, the results show that farmers' experience, contact with extension workers and household size have a positive and statistically significant impact on technical efficiency. This implies that farmers who have long tenure in fish farming and also the opportunity to meet with extension workers are operating close to the production frontier (technically efficient). On the other hand, the age of the farmers has a negative and statistically significant impact on technical efficiency. Although educational level and farm status have a positive impact on technical efficiency, they are statistically insignificant. Furthermore, all the inputs used in the production process of different culture systems and species contained slacks and need to be reduced accordingly. Feed, the major input in fish production and constituting over half of the production costs, is equally over-utilized. Thus, the government, in collaboration with research institutes and universities, should design a feeding formula for fish depending on species, culture systems and stages of growth. This could help to reduce production costs, increasing the farmers' income, as well as providing much needed animal protein to consumers at an affordable rate.

Keyword: Bootstrapping data envelopment analysis (DEA); Technical efficiency; Technical inefficiency; Freshwater aquaculture; Malaysia